REMARKS

Applicant has amended the above-identified application in response to the Office Action dated October 25, 2004.

In brief, Applicant has amended the specification, drawings and claims in order to address each of the issues on pages 2 and 3, paragraphs 1-5 of the Examiner's remarks. In particular, new formal drawings are enclosed and which include revisions to Fig. 2, sheet 2 of 3. Additional revisions have been entered to claim 2, and the Abstract of the Disclosure has been redrafted as required by the Examiner.

Applicant has further amended the claims both to overcome the cited references of record and to place in allowable form those presently indicated to be allowable, in particular claims 1, 2, 5 and 7. Claims 16-20 have been canceled, and new claims 21-26 added. In sum, claims 1-15 and 21-26 remain pending.

The Examiner rejected the claims, in particular independent method claim 1, over the cited combination of Dundorf 6,459,952 in combination with English 3,857,025. Independent method claim 18 was further rejected over the above references and in further view of Hokazono 6,063,480.

Addressing first amended claim 1, the method for creating a three-dimensional engraving has now been amended to further recite the step of former claim 6, i.e., the step of projecting the three-dimensional illustration further including assigning a depth of cut per pixel distributed across a selected machining area.

As pointed out by the Examiner, Dundorf teaches a CAD system for machining a wood carving into a sign, and which includes a color graphic scheme for establishing a depth of cut for a given color. Respectfully, it is however submitted that the step of displaying on a CAD

systems color graphics viewing screen the "inner" and "outer" offsets associated with the island characteristic outlines (see at 22A, 22B and 22C in Fig. 4f), for review, does not teach or suggest, or otherwise render obvious, the step of assigning depths of cut per pixel distributed across a selected machining area.

Specifically, the Dundorf reference teaches projecting two-dimensional and offset contour lines into a three-dimensional coordinate plane system, the presumption being that a color selected from a color scheme is assigned to a given contour line. This is respectfully submitted to not teach or render obvious the assigning of a depth of cut per pixel, and as now recited in amended claim 1.

Specifically, the application of pixels as utilized in the present invention is in order to create a two-dimensional bitmap from a collection of individual pixels (the preferred application of Fig. 6 assigning a range of at least 200 pixels per square inch), and with which selected depths of cut are assigned. Dundorf teaches translating each of the geometrically similar outlines a predetermined distance along a third dimension (z axis) of the 3D coordinate system, in order to determine a location of a "center line" curve of a 3D character produced from a transformed two-dimensional character, and projected into a 3D space.

Accordingly, Dundorf does not teach or suggest assigning depth of cut per pixel, as it only teaches projecting offset contour lines on a color graphics viewing screen for the purpose of locating its associated center line. As further described in column 14, lines 23, et seq., Dundorf interactively introduces a plurality of points in the 3D coordinate system at locations corresponding to points lying along a 3D tool path (such as with a stylus or mouse) and in order to establish the desired path of the cutting tool for machining along a given line.

In effect, the present invention assigns depth of cut per each 2D pixel, making possible the creation of elaborate 3D machined designs. In contrast, Dundorf utilizes the combination of contour lines and a CAD color graphics screen to interpolate individual points along the lines into a 3D cutting path. Therefore, this is not the obvious equivalent of pixel based assignment of depth, since Dundorf deals in contour lines as a subset of measurement, in contrast to individual 2D pixels (points) as in the present invention.

Addressing further English, the Examiner argued that it disclosed the feature of shading the three-dimensional machined surface (as accomplished previously by the assignment of individual pixels for given depths of cut) according to given depths of machining. Of note, English, referring to column 11, lines 49 et seq., teaches the indicated cutting motions as providing the shaded appearance in the engraved cut.

In contrast, the shading of the surface, as recited in claim 1 in the present invention, is accomplished **following** the 3D machining of the solid and not as a function of the immediate step of machining. Specifically, and as is further clarified in the dependent claims (e.g., claims 9-11), the step of shading in the instant invention is provided by the oxide bath and subsequent abrading steps. It is further averred that English, despite teaching an NC programmable system for automatic simulation by computerized machinery, does not teach or suggest the features of the method, as recited previously in claim 1 and as argued above in relation to the Dundorf reference.

Addressing further the Nohara reference, cited in combination with English and Dundorf against dependent claim 2, it is submitted that the distinguishing features of the independent claims, in particular claims 1 and 18, likewise patentably distinguish over this reference. Nohara further teaches a metallic coil production system and which does not teach or suggest any of the

primary steps associated with the present invention, and in particular those set forth in amended independent claims 1 and 18.

Hokazono, cited in combination with Dundorf and English against claims 9-14 and 18, further teaches an artificially patinated copper material, such as for use in producing copper roofing, and was cited by the Examiner as disclosing the steps of the oxide bath, neutralizing solution and abrading in order to shade the machined workpiece of the present invention. Respectfully, it is submitted that Hokazono does not teach or suggest any similar application to the method steps recited in the claims of the present invention and, most notably, does not bear any relation to the method for creating the three-dimensional carving as set forth in the claims of the present invention.

Hokazono teaches applying a pigmented or patinated style coating to a surface of a copper base plate. This is not the same as the method steps of the oxidation coating, neutralizing and abrading in order to shade the surface of the three-dimensionally formed engraving.

Applicant also includes new independent claims 21-26 which incorporate the allowable subject matter indicated on page 8, paragraph 10. Specifically, new claim 21 incorporates the allowable limitations of claim 3 along with original claim 1 (claim 7 being amended to depend from new claim 21). New claim 22 incorporates the allowable subject matter of claim 4 and original claim 1 (claim 5 being amended to depend from new claim 22).

Additional new independent claims include new claim 23 (combining claims 1, 6 and 16), new claim 24 (combining 1, 6 and 17) and new claim 25 (combining claims 18 and 19). Finally, new independent claim 26 combines the recitations of original independent claim 18 and allowable dependent claim 20.

Applicant respectfully submits that, with the above-indicated revisions, all of the claims in the application are in appropriate form for allowance and favorable action is respectfully requested. Attorney for Applicant may be reached at (248) 647-6000 with any questions the Examiner may have.

Respectfully submitted,

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Judith T. Lange

AMENDMENTS TO THE DRAWINGS

Applicant encloses herewith formal corrected drawings, sheets 1-3, Figs. 1-8. Included with the formal corrected drawings is the renumbering of process step 66 in Fig. 2 as 67 and in order to avoid confusion with the general illustration of the oxide bath 66 in Fig. 6. Approval of the formal corrected drawings is respectfully requested.